

SOCIAL COMPETENCE AND SOCIAL PROBLEMS IN CHILDREN RECENTLY
DIAGNOSED WITH CANCER

By

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CHAPTER 1

BACKGROUND

Approximately 14,000 children and adolescents in the United States are diagnosed with cancer each year (United States Cancer Statistics, 2013). Progress in medical efforts to treat pediatric cancer has led to a significant decrease in mortality rate, with five-year survival rates increasing dramatically from 58% in 1975-1977 to above 80% in 2003-2009 (SEER Cancer Statistics Review, 1975-2010).

Increasing survival rates have led to a shift in focus towards investigating the quality of life of children diagnosed with cancer. Investigation of the quality of life of pediatric cancer patients has focused on various facets, including physical sequelae of cancer treatment (Ness et al., 2009), psychological outcomes (Eiser, Hill, & Vance, 2000; Kurtz & Abrams, 2010), and behavioral outcomes (Challinor, Miaskowski, Moore, Slaughter, & Franck, 2000; Fuemmeler, Elkins & Mullins, 2002a). Within this body of literature, one area that has garnered particular attention is that of the social functioning of children diagnosed with cancer (Challinor et al., 2000; Martinez, Carter, & Legato, 2011; Patenaude & Kupst, 2005; Stam, Grootenhuys, & Last, 2001).

The current study examined Social Competence and Social Problems in children and adolescents with recently diagnosed cancer. First, in order to provide a better understanding of approaches to the study of social functioning in pediatric cancer, definitions of facets of social functioning and measures used most frequently to assess this construct are reviewed. Second, findings from previous studies investigating social functioning in youth diagnosed with cancer are summarized. Third, studies that have reported demographic or medical variables

associated with difficulties in social functioning in children diagnosed with cancer are noted. Finally, a brief review of studies that have investigated this relationship in children within the first year of diagnosis is provided. Reviews of the literature are accompanied by a commentary on the significant heterogeneity in methodological approaches to the study of social functioning in children diagnosed with pediatric cancer.

Definitions and Measures of Social Functioning

Perhaps one of the greater impediments to synthesizing the literature on the social functioning on pediatric cancer patients is the lack of consensus on a definition of social functioning (Yeates et al., 2007). Throughout this thesis, in order to provide a more comprehensive review of the literature on how children diagnosed with cancer relate to others, “social functioning” will be used to refer broadly to the manner in which children interact with others, participate in social organizations and perform social tasks. Relationships with “others” will include competent and problematic interactions with friends, family members, as well as within other close or intimate relationships. However, analyses conducted in the current study will be specific to Social Competence and Social Problems as measured by the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) and Youth Self-Report (YSR; Achenbach & Rescorla, 2001). To begin, in order to provide a better understanding of the construct of social functioning as employed within the literature on children diagnosed with cancer, a brief review of the most commonly used measures that assess social functioning within this population follows.

Social Competence and Social Problems. One approach to assessing social functioning is through the Social Problems and Social Competence scales contained within the Achenbach System of Empirically Based Assessment (ASEBA) that includes the Child Behavior Checklist (CBCL), Teacher Report Form (TRF), and Youth Self Report (YSR) measures (Achenbach & Rescorla, 2001). The CBCL is a 118-item survey of areas of competence and problems in youth

which is typically filled out by a child's parent/caretaker. The TRF is similar to the CBCL, but is completed by the child's teacher. The YSR is the corresponding self-report measure that can be completed by children ages 11-18-years-old and produces similar scales as the CBCL. The CBCL, TRF and YSR offer several advantages: they are well validated, have a large representative normative data set, and allow for multiple informants of the same constructs (2001). In addition, the CBCL, TRF and YSR offer the possibility of investigating two facets of social functioning: Social Competence and Social Problems.

The Social Competence scale on the CBCL, TRF and YSR contains items assessing participation in group activities and social relationships. Informants are asked to list the number of clubs/teams organizations the child participates in, jobs/chores the child has, number of friendships, and number of times the child interacts with friends. For each of these items, informants are also asked to rate how well or how frequently the child performs these actions compared to same age peers. This scale can be understood as a positive indicator of social functioning.

The Social Problems scale on the CBCL, TRF and YSR assesses immature social behaviors as well as difficulties in peer relationships. This scale is reflected in items assessing Examples of items from this scale include: "clings to adults or too dependent," "gets teased," "not liked," "too dependent," "prefers being with younger children," and "lonely". This scale can be broadly understood as representing a negative indicator of social functioning.

Although a high score on the Social Competence scale can be understood as a positive indicator of social functioning and an elevated score on the Social Problems scale on the Social Problems scale can be seen as a negative indicator of social functioning, these scales contain distinct items and are separate measures of children's social functioning. In other words, a child obtaining a high score on one scale will not necessarily receive a low score on the other.

Therefore it is important to understand and assess both these constructs. The correlations between these two scales across informants will be examined in the preliminary analyses of this study.

Social Adjustment and the Revised Class Play. The Revised Class Play (RCP; Masten, Morison & Pellegrini, 1985) is another measure that has been used frequently in the study of the social functioning of children diagnosed with cancer. The RCP is a measure that allows peers and/or teachers to nominate individuals for roles in a play that correspond to the following three dimensions of behavior: (a) sociability-leadership, (b) aggressive-disruptive, and (c) social isolation. Examples of descriptions associated with social-leadership roles include: “someone everyone likes to be with,” “someone who has many friends,” and “someone who has good ideas for things to do.” Those nominated for aggressive-disruptive roles were associated with some of the following example items: “too bossy,” “teases other children too much,” and “shows off a lot.” Finally, children nominated for sensitive-isolated roles were associated with the following items: “often left out,” “feelings get hurt easily,” and “usually sad” among other items related to this construct. This measure has been shown to have good reliability and validity. The three dimensions have been found to be both internally consistent, with alphas ranging from .81 to .95, and stable across time, with correlations across 17 months ranging from .63 to .65 (Masten, et al., 1985).

Social Functioning in Children with Cancer

A review of the literature on social functioning in children diagnosed with cancer yields consistent as well as conflicting findings. Earlier studies noted that children with cancer were often teased, isolated, and avoided by peers (Chesler & Barbarin, 1986). More recently, findings from a study of 291 children diagnosed with Leukemia and 291 healthy classmates indicated that children diagnosed with cancer were less likely than controls to reach out to others, initiate activities, interact with friends, and try new things (Adamoli, Deasy-Spinetta, Corbetta, et al.,

1997). Similarly, in a study conducted analyzing the content of a group discussion of pediatric cancer survivors, being made fun of by peers and a lack of friendships with classmates were among the major themes that emerged (Barrera, Spiegler & Baruchel, 2000). Children diagnosed with cancer also experience difficulties within the friendships that they do maintain. For example, in an observation task of a child diagnosed with cancer and his/her best friend, Katz, Leary, Breiger and Friedman (2011) found that, compared to healthy best friend dyads, children diagnosed with cancer experience greater disengagement throughout the interaction; that is, children diagnosed with cancer were more likely to leave the common play area, ignore or change the subject when their friend disclosed highly personal information, and had a greater difficulty sustaining a common activity and playing without parental intervention.

Several studies using the ASEBA scales have indicated difficulties in social functioning in children diagnosed with cancer. Studies of children diagnosed with cancer have identified 25% (Mulhern et al., 1989) to 48% (Fossen, Abrahamsen, & Storm-Mathisen, 1998) of their sample as being in the clinical range on the Social Competence scale of the CBCL. In a separate study, both teachers and parents rated cancer survivors as less socially competent than their healthy peers using both the CBCL and TRF (e.g., Olson, Boyle, Evans, & Zug, 1993). Consistent with findings of lower scores on the Social Competence scale of the CBCL, Pendley, Dahlquist and Dreyer (1997) found that adolescents who completed cancer treatment participated in less than half as many peer activities as controls.

Further studies have also documented significant difficulties in social functioning in comparison to the CBCL normative data. In a study of children diagnosed with cancer at a mean age of 4.77 years, reports on the CBCL from 126 parents of children who were on average 4.2 years from diagnosis indicated a social functioning score approximately one-half of a standard deviation below the normative mean (Noll et al., 1997). As previously noted, the Mulhern et al.

(1989) reported that 25% of their sample obtained clinically significant scores on the Social Competence scales of the CBCL, which is more than four times the expected percentage within the general population. Within this study, although median age at data collection was 12.2 years, median age at diagnosis of this sample was 2.7 years (1989). The latter findings are all the more concerning given that there is some evidence that children diagnosed during infancy have a lower risk of developing psychosocial difficulties relative to those diagnosed during middle childhood or adolescence (Koocher, O'Malley, Gogan, & Foster, 1980).

Finally, there is some evidence collected from ASEBA related scales that indicate difficulties in social functioning in long term survivors of pediatric cancer. Data from the Childhood Cancer Survivorship Study (CCSS), the largest study of pediatric cancer survivors, found in a sample of 2,979 survivors with a mean age of diagnosis of 3.2 years and a mean age at interview of 14.8 years, that survivors of leukemia and central nervous system (CNS) tumors had higher antisocial and lower social competence scores than their healthy siblings (Schultz, Ness, Whitton, Recklitis, Zebrack et al., 2007). Within this study, the authors used the Behavior Problem Index, which is a subset of 27 items selected from CBCL. The antisocial domain contains several items that are also on the Social Problems subscale of the CBCL (e.g., “Has trouble getting along with other children,” “Is not liked by other children;” Schultz et al., 2007). Given that data was collected approximately a decade post diagnosis, these findings suggest that a pediatric cancer diagnosis may be associated with significant long-term difficulties in social functioning.

Although the CBCL and YSR have been used in previous investigations of social functioning in children diagnosed with cancer, there is some concern regarding the use of this instrument with children who are chronically ill (Drotar, Stein, & Perrin, 1995). Criticisms of the assessment of social competence in chronically ill children using the CBCL note that low social

competence scores may be related to medical restrictions on activities, not to lack of desire to participate in such activities (Drotar et al., 1995). However, in response to this criticism, lower Social Competence within this population remains of clinical importance, regardless of the reason for low activity, and therefore warrants empirical attention. Regardless of reason for low Social Competence, decreased participation in activities and friendships during this period may ultimately contribute to further difficulties.

Using the RCP, children diagnosed with cancer have been identified as significantly more socially isolated than their peers, according to self (Noll, Bukowski, Davies, & Koontz 1993; Vannatta, Gartstein, Short, & Noll, 1998), peer (Noll, LeRoy, Bukowski, Rogosch, & Kulkarni, 1991; Noll et al. 1993; Vannatta et al., 1998), and teacher (Noll, Bukowski, Rogosch, LeRoy, & Kulkarni, 1990; Vannatta et al., 1998) report. However, within these same studies, other findings include no differences in popularity and number of mutual friends (Noll et al., 1991) as well as no difference in friendship nominations, reciprocated friendships and social acceptance (Noll et al. 1993). Indeed, in a later study by Noll et al. (1999) using the same methodology, teachers selected children diagnosed with cancer more often for sociability/leadership scores, and both teachers and peers selected these children less often for aggressive/disruptive scores. Conflicting findings may reflect cohort changes in attitude towards children with cancer and highlight the need for further study and clarification of the social functioning of children diagnosed with cancer.

In terms of long-term social outcomes, pediatric cancer survivors may have lower rates of marriage or they may marry later compared to peers, siblings, or national norms (e.g., Byrne, Fears, Steinhorn, et al. 1989; Felder-Puig, Formann, Mildner, et al., 1998; Gray, Doan, Shermer, et al., 1992b; Green, Zevon, & Hall, 1991; Langeveld, Ubbink, Last et al., 2003; Nagarajan, Neglia, Clohisy, et al., 2003; Rauck, Green, Yasui, et al., 1999). However, a recent study found

that the proportion of young adult survivors of pediatric cancer that were dating and expressed plans to marry was similar to that found in healthy peers (Gerhardt, Vannatta, Valerius, Correll & Noll, 2007).

Overall, although several studies have identified areas of difficulty in social functioning, others have also indicated that these children do not experience any significant difficulties (Gerhardt et al., 2007; Noll et al., 1999). There is some consensus that, although not all children may experience significant difficulties in peer relationships, a significant subgroup may encounter problems (Eiser, et al., 2000) and further research is needed in order to better identify this subgroup (Gerhardt et al., 2007).

Correlates of difficulties in social functioning in children diagnosed with cancer. Several factors may account for variability in difficulties in social functioning in youth diagnosed with cancer. Type of diagnosis is among the variables that have received the greatest empirical support, with a pediatric brain tumor diagnosis being frequently associated with increased social difficulty relative to other diagnoses (Bonner et al., 2008; Carpentieri, Mulhern, Douglas, Hanna, & Fairclough, 1993; Fossen, et al., 1998; Vannatta, et al., 1998). For example, in a study comparing children with brain tumors and children with other cancers, Carpentieri et al. (1993) found that children diagnosed with brain tumors were rated lower in social competence than youth with non-CNS tumors according to parent report.

A further study comparing children with brain tumors and those with acute lymphoblastic leukemia (ALL) found that children with brain tumors were rated as less socially competent according to both teacher and parent report (Fossen et al., 1998). Children diagnosed with brain tumors were also rated as having significantly greater social problems than youth with Juvenile rheumatoid arthritis (Bonner et al., 2008). In addition, more CNS-directed treatment for pediatric cancer has been related to being less liked by peers, having fewer friends, and being perceived by

classmates as socially isolated (Vannatta et al., 1998). However, in an exception to this pattern, a study comparing 81 children with brain tumors and 31 children with non CNS malignancies, no significant difference was found in percentage of children in the clinical range on Social Competence as well as across CBCL scales overall (Mulhern, Carpentieri, Shema, Stone, & Fairclough, 1993).

Second, there is mixed evidence suggesting that older age at diagnosis is associated with better social functioning. Age at diagnosis was positively associated with greater parent-reported social competence and fewer social problems in a large (N = 220) longitudinal study of pediatric embryonal tumor (a type of brain tumor that forms when the fetus is beginning to develop) survivors (Brinkman et al., 2012). However, other studies have found no such relationship (Katz et al., 2011; Noll et al., 1990; Vannatta et al., 1998).

Third, there is mixed evidence that time since diagnosis is associated with differential social outcomes. Increased time since diagnosis has been associated with decreased social competence (Carpentieri et al., 1993). Conversely, Gerhardt et al. (2007) found that time since diagnosis was positively associated with father report of survivors' participation in activities. Other studies have reported no relationship between time of diagnosis and social functioning (Mulhern et al., 1993; Vago et al., 2011).

Finally, there is limited evidence that gender differences in social functioning exist in youth diagnosed with cancer (Brinkman, 2012). However, others have failed to find a difference in social functioning based on gender (Martinson, & Bossert, 1994; Katz, et al., 2011; Noll et al., 1990; Mulhern et al., 1989; Vannatta et al., 1998).

Overall, there is evidence for a brain tumor diagnosis being associated with greater difficulties in social functioning, but findings regarding other medical or demographic variables have been mixed. The identification of these correlates would be crucial in recognizing which

subgroups of children diagnosed with cancer may be in particular need of resources to address difficulties in social functioning.

There is also some evidence that demographic variables pertaining to the parents of children diagnosed with cancer are also associated with the social functioning of their child. For example, Mulhern et al. (1993) found that children diagnosed with a brain tumor from a single parent home had depressed social scale scores as compared with children from a home with two caregivers. However, this relationship was not present for children diagnosed with non-CNS malignancies (1993). A further factor that has been associated with differential social functioning is that of parent education level. Greater parental education has been associated with higher social competence scores for children with cancer (Brinkman et al., 2012) and a greater likelihood of using friends as confidants (Barrera et al., 2005). However, unexpectedly, parental education has also been associated with a decline in social competence scores over time in a large, longitudinal study of children diagnosed with cancer (Brinkman et al., 2012). Finally, a finding from an early investigation of pediatric cancer survivors by Koocher and O'Malley (1981) indicated that parental socioeconomic status correlated positively with adjustment. Several decades later, data from the large CCSS confirm that low household income is associated with increased peer conflict and social withdrawal (Schultz et al., 2007). However, in contrast, Katz et al. (2011) failed to find a relationship between socioeconomic status and any of the peer play variables in their investigation of the quality of the dyadic peer interactions of children diagnosed with cancer.

These findings highlight the importance of looking beyond individual factors and investigating parent related variables within this population. Evidently, further clarification is needed regarding the influence of several medical and demographic variables on the social functioning of pediatric cancer patients.

Heterogeneity in methodological approaches to the study of social functioning and pediatric cancer. Although significant contributions to the literature on social functioning in children with pediatric cancer have been made, synthesis of this literature and a corresponding greater understanding of this topic have been limited by the considerable heterogeneity in methodological approaches. Researchers have used a variety of measures to assess social functioning in children diagnosed with cancer. Several have used peer nomination measures such as the RCP (Noll et al., 1990, 1993, 1998; Vannatta et al., 1998), other have used questionnaires such as the CBCL (e.g., Fossen et al., 1998; Mulhern et al., 1989; Noll et al., 1997; Pendley et al., 1997), observation tasks (e.g., Katz et al., 2011), or interviews (e.g., Bessell, 2001; Upton & Eiser, 2006). Further, studies have collected data on the social functioning of children diagnosed with cancer from various informants, including researchers (e.g., Katz et al., 2011), parents (e.g., Brinkman et al., 2012), teachers (e.g., Olson et al., 1993), classmates (e.g., Vannatta et al., 1998), and child self report (e.g., Schultz et al., 2007).

Studies have also varied in the use of their comparison sample. Children diagnosed with cancer have sometimes been compared to their classmates (e.g., Vannatta et al., 1998), children within healthy best friend dyads (e.g., Katz et al., 2011), healthy siblings (Schultz et al., 2007), large normative samples of their same aged peers on the CBCL and related measures (e.g., Brinkman et al., 2012), children with another chronic illness (e.g., Bonner et al., 2008), or simply to changes within subject over time (e.g., Vago et al., 2011).

In addition, there has been considerable variation in sample size, with sample size of children diagnosed with cancer often being relatively small, ranging from 16 to 28 participants (e.g., Ida et al., 1994; Noll et al., 1990, 1991; Olson et al., 1993; Pendley et al., 1997; Vago et al., 2011; Vannatta et al., 1998). Given the low incidence rate of this disease, as well as the accompanying stress faced by families of children diagnosed with cancer (Rodriguez et al.,

2011), recruitment of any number of children is commendable. However, it is possible that these small sample sizes impeded studies from identifying significant correlates of difficulties in social functioning due to low statistical power.

A further methodological limitation is the possibility for cohort effects. Given the rapid advances in treatment and corresponding drastic reduction in mortality rates, the experience and psychosocial outcomes of a pediatric cancer diagnosis within the past decade may differ from those diagnosed 20 to 30 years ago. For example, Syndikus, Tait, Ashley, & Jannoun (1994) reported problems in social functioning in children diagnosed with cancer. However, this sample consisted of children who were diagnosed between 1952 and 1986, with a 49% survival rate at 5-years. Investigation of psychosocial outcomes in current samples of youth recently diagnosed with cancer is imperative in order to provide the resources that best meet the needs of these youth.

Finally, there are large discrepancies both within and across studies for the time between diagnosis and data collection. Studies of social functioning in children diagnosed with cancer often focus on survivorship (Stam & Grootenhuys, 2001). Those that do include children who are closer to diagnosis also include within the same sample children who are several years past diagnosis; e.g., 2 to 11 years post diagnosis (Fossen et al., 1998); 12 to 96 months post diagnosis (Katz et al., 2011); 5 to 15.2 years (Mulhern et al. 1989); 2 years to 12 years (Upton & Eiser, 2006); and 17 to 95 months (Noll et al., 1991). This variability may obscure findings, given evidence that time since diagnosis is associated with variation in adjustment (Carpentieri et al., 1993; Mulhern et al., 2007).

Given the findings associated with difficulties on social functioning in pediatric cancer survivors, investigation of social functioning within children more recently diagnosed with cancer may provide valuable information regarding the development of these difficulties. A

limited number of studies have reported findings associated with the social functioning of youth diagnosed with cancer within the first year of diagnosis only (Brinkman et al., 2012; Brown et al., 1992; Mulhern et al., 1993; Sawyer et al., 1995; Vago et al., 2011; Varni et al., 1996). Within these studies, assessment of social functioning was limited by single informant report (Brinkman et al., 2012; Mulhern et al., 1993; Varni et al., 1996); sample size, ranging from 23 to 40 participants (Brown et al., 1992; Sawyer et al., 1995; Vago et al., 2011); and specificity of diagnostic type (children with embryonic tumors only, Brinkman et al., 2012; children with brain tumors only, Vago et al., 2011; children with non-CNS malignancies only, Brown et al., 1992, Mulhern et al., 1993, Sawyer et al., 1995).

In sum, there is considerable heterogeneity in methodological approaches to the study of social functioning in pediatric cancer populations. The current study is part of a large, multiple informant study of recently diagnosed children with heterogeneous cancers that provides an opportunity to study problems on social functioning in this population near the time of their diagnosis. Further, this study provides an opportunity to confirm or disconfirm previous findings and identify factors associated with the early experience of difficulties in peer relationships in youth diagnosed with cancer.

Current Study

The current study examined Social Problems and Social Competence in a large, multiple informant sample of children recently diagnosed with cancer. Several hypotheses were tested:

(1) I hypothesize that children's Social Problems will be elevated and Social Competence will be decreased in children diagnosed with cancer relative to population norms.

(2) I further hypothesize that a larger percentage of children diagnosed with cancer than in normal population will be in clinical range on both Social Problems and Social Competence scales.

Subsequent to these primary analyses I will examine potential child demographic and medical status correlates.

(3) Third, I hypothesize that there will be a significant effect of type of cancer diagnosis, with children diagnosed with brain tumors performing worse across scales of social functioning than children diagnosed with other pediatric cancers.

(4) Fourth, given the limited and conflicted literature on potential effects of gender, time since diagnosis and age at diagnosis on social functioning, associations with these variables will be explored.

(5) Finally, I will also examine the potential influence of parent demographic factors. Based on findings in the literature, I hypothesize that parental income will be negatively correlated with Social Competence and Positively correlated with Social Problems, and greater Social Problems and lower Social Competence will be found for children of single, as opposed to partnered, parents.

This sample provides an opportunity to identify the correlates of Social Problems and Social Competence in a large, multiple informant sample of children recently diagnosed with cancer. Results will supplement previous literature in order to provide a much-needed methodologically strong overview of social functioning in children recently diagnosed with cancer. Further, these findings will inform the development of crucial interventions through the early identification of youth experiencing social difficulties.

CHAPTER II

METHOD

Participants

Participants were 334 children and adolescents with cancer (ages 5-17 years old) and their parents (319 mothers and 167 fathers of 334 patients). Reports were obtained from all of these parents about their children's coping and social functioning and child self-reports were obtained from 157 adolescents (ages 10-17 years old) who were old enough to complete the self-report measures used in this study. Seven families (6 mothers and 2 fathers) provided insufficient data and were thus excluded from the analyses. Children were retained in the sample if at least one informant provided data on child social functioning. Thus, the final sample included 478 parents (313 mothers and 165 fathers of 327 children) who provided reports on their children's coping and emotional distress and 155 children/adolescents (ages 10-17 years) who provided self-reports on their coping and social functioning.

For all families included in the study, children were on average 10.6 years old ($SD = 3.9$), and 51.4% ($n = 168$) were male. Race and ethnicity of all children included in the sample was 84.4% ($n = 276$) White/Caucasian, 9.8% ($n = 32$) Black/African-American, 0.3% ($n = 1$) Asian-American, 0.3% ($n = 1$) American Indian/Native Alaskan, and 5.2% ($n = 17$) other. Children had diagnoses of leukemia (36.1%; $n = 118$), lymphoma (25.4%; $n = 83$), brain tumor (8.9% $n = 29$), and other solid tumors (e.g., osteosarcoma, Wilm's tumor; 29.7%; $n = 97$). Thirty-six children (11%) were recruited into the study following a relapse of their original cancer. For the subgroup of children who were old enough and provided self-report data, children were on average 13.6 years old ($SD = 2.4$); 47.7% ($n = 74$) male; 87.7% ($n = 136$) White/Caucasian, 9% ($n = 14$)

Black/African-American, and 3.2% (n = 5) other. They had diagnoses of leukemia (32.3% n = 50, lymphoma (34.2%; n = 53), brain tumor (4.5%; n = 7), and other solid tumor (29%; n = 45).

Sixteen (10.3%) were children with relapsed disease.

Mothers were on average 37.9 years old (SD = 7.52), and fathers were 39.9 years old (SD = 7.9). The families represented a variety of annual income levels: 2.8% (n = 9) did not report family income, 27.8% (n = 91) earned \$25,000 or less, 27.5% (n = 90) earned \$25,001-\$50,000, 15.3% (n = 50) earned \$50,001-\$75,000, 11.6% (n = 38) earned \$75,001-\$100,000, and 15% (n = 49) earned over \$100,000.

Procedure

The Institutional Review Boards at two hospitals in the Southern and Midwestern United States approved the study protocol. Parents and children were recruited from cancer registries at two pediatric oncology centers in the midwestern and southern United States. Parents were approached in the clinic or hospital by a member of the research team in order to introduce the study. Families received compensation when at least one parent or child completed the measures. Eligible families had children who: (a) were ages 5–17 years, (b) had a first diagnosis or relapse of cancer, (c) were receiving treatment through the oncology division, and (d) had no pre-existing developmental disability. Parents provided self-reports and completed measures about their children, and children ages 10–17 years provided self-report data on age-appropriate measures. Parents willing to participate completed an informed consent form, and children (ages 10–17 years) completed an assent form. Questionnaire packets were given to participants to complete at the hospital or at home. In the case that only one parent was present, consent forms and questionnaires were sent home for the other parent to consider. Families were approached shortly after the child's first diagnosis or relapse (M= 1.47 months, SD= 1.33). Parents and children completed the questionnaires on average 2.5 months (SD= 2.1) after the child's first diagnosis or

relapse.

Measures

CBCL and YSR. Adolescent self-reports and mothers' and fathers' reports of their children's Social Competence and Social Problems were assessed using the Youth Self-Report (YSR) and the Child Behavior Checklist (CBCL) (Achenbach & Rescorla, 2001). The CBCL and YSR respectively, assess parents' perceptions of their child and their child's self-perceptions of emotional and behavioral problems over the past 6 months. For each of the 118 items (ex: "Cries a lot"), the respondent is asked to indicate whether the qualifier is "Not True" (0), "Somewhat or Sometimes True" (1), or "Very True or Often True" (2). As previously mentioned, the Social Problems and Social Competence scales of the CBCL and YSR were used. The Social Problems scale includes items assessing whether the child acts young, is clingy, does not get along with peers, is clumsy and if the child prefers to play with younger children. The Social Competence scale assesses mean level of participation in organizations, frequency of contact with friends, behavior with others, and responsibilities. A higher score on the Social Problems scale and a lower score on the Social Competence scale each indicate possible difficulties in social functioning. The large normative sample associated with the CBCL and YSR allowed for the development of "Clinical" and "Borderline" cutoffs for each scale. Scores in the bottom 2 percentiles of T scores for the Social Competence scale and top 2 percentiles for the Social Problems scale are considered to be of clinical concern. Scores beneath the 7th percentile for Social Competence and scores above the 93rd percentile for the Social Problems scale are considered to be within the borderline and clinical range. Reliability and validity of the CBCL and YSR are well established (Achenbach & Rescorla, 2001).

Demographic and Medical Data.

Parents provided demographic information including age, education level, race, family income, and marital status. Child self reported age, race, and educational level were used if neither parent provided this data. Participants gave permission for the research staff to access medical data, where the child's diagnosis/relapse status was extracted.

Data Analytic Strategy

A series of *t*-tests were conducted in order to compare social functioning of children recently diagnosed with cancer to the normative means provided by Achenbach and Rescorla (2002). Second, Chi-square analyses were used to determine if the percentage of children experiencing social difficulties was different from that expected in a general population. Third, ANOVAs were employed in order to examine whether social functioning varied as a function of type of diagnosis. Finally, a series of *t*-tests and correlation analyses were performed in order to determine whether social competence and social problems were related to child or parent demographic variables. Of note, all analyses investigating factors that may influence social functioning in children diagnosed with cancer were repeated twice: once using raw CBCL/YSR scores and once using the age and gender adjusted *T* scores. Raw scores allow for a greater variability in data given that certain raw scores are assigned the same *T* score when transformed (Achenbach & Rescorla, 2001). Analyses using *T* scores will allow for the control of normative differences in age and gender.

CHAPTER III

RESULTS

Preliminary Analyses.

Bivariate correlation analyses were performed in order to examine the relationship between Social Problems and Social Competence T scores as reported by mother, father and child self report (see Table 2). There was a small to medium significant negative correlation between Social Competence and Social Problems T scores within both mother ($r = -.28$, $p < .01$) and father ($r = -.29$, $p < .01$) report of these scales. The small negative correlation ($r = -.12$) between child self reported Social Problems and Social Competence was non-significant.

Hypothesis 1: Social Problems will be elevated, and Social Competence will be decreased in children diagnosed with cancer relative to population norms.

Social Problems T scores ranged from 50-80 across mother ($M = 53.69$, $SD = 5.53$), father ($M = 53.01$, $SD = 4.28$) and child report ($M = 54.12$, $SD = 6.38$). These scores all represent small effect sizes relative to normative data with Cohen's d 's ranging from $d = .30$ to $.41$. A series of t -tests revealed that Social Problems in children diagnosed with cancer were significantly elevated relative to population norms according to mother $t(305) = 11.65$, $p < .001$, father $t(162) = 8.95$, $p < .001$, and child self report $t(156) = 8.07$, $p < .001$.

Social Competence T scores ranged from 20-65 across mother ($M = 45.99$, $SD = 9.58$), father ($M = 45.45$, $SD = 9.82$) and child report ($M = 47.40$, $SD = 10.20$). These scores also represent small effect sizes ranging from $d = .26$ to $.46$ relative to population norms. Social Competence in children diagnosed with cancer was significantly lower relative to population

norms according to mother $t(301) = 7.26, p < .001$, father $t(160) = 5.86, p < .001$, and child self-report $t(152) = 3.14, p < .01$.

Hypothesis 2: A larger percentage of children diagnosed with cancer will be in clinical range on both Social Problems and Social Competence scales relative to population norms.

A series of Chi-square analyses were performed in order to determine if a greater percentage of children recently diagnosed with cancer obtained scores in the borderline and/or clinical range on the Social Problems and Social Competence scales relative to population norms. T scores of 70 and above were considered to be in the clinical range on the Social Problems scale, with an expected 2% of the normative population falling in this range (Achenbach & Rescorla, 2001). The borderline T score cut off of 65 on the Social Problems scale was also used in the analyses, with an expected 7% of the population to be at or above this score (Achenbach & Rescorla, 2001). There were no significant differences between children recently diagnosed with cancer and population norms in terms of percentage of children at or above the borderline or clinical cutoffs on the Social Problems scale according to mother (5.3% borderline, 2.3% clinical), father (3.7% borderline; 0% clinical), or child self report (7.1 % borderline, 4.5% clinical) (see Table 4).

Next, differences were explored between percentage of children recently diagnosed with cancer experiencing clinical and borderline difficulties in Social Competence versus those found in age and gender matched norms. An expected 2% of children are expected to be within the clinical range of difficulties in Social Competence, which consists of scores at or below a T score of 31 (Achenbach & Rescorla, 2001). According to father report, 8.8% of children were experiencing clinical difficulties in Social Competence, which is a significantly higher percentage than would be expected in the normative sample, $\chi^2(1, N = 160) = 4.53, p = .03$. The percentage

of children diagnosed with cancer in the clinical range of the Social Competence scale was not significantly different from those found in a normative sample, according to both mother (5.4%) and child (6%,) report. The cutoff associated with the borderline range within the normative sample is a T score of 35, and 7% of the normative sample obtain scores at or below this cutoff (Achenbach & Rescorla, 2001). A significantly higher percentage of children diagnosed with cancer obtained borderline or lower scores on the Social Competence scale relative to that found in a normative sample. Specifically, according to mother report 17.4% of children diagnosed with cancer experienced borderline or greater difficulties in Social Competence $\chi^2(1, N = 301) = 5.05, p = .02$. Fathers reported 15.9% of children as having the same level of difficulty $\chi^2(1, N = 160) = 3.91, p = .04$. Finally, 17.8% of children self reported having borderline or greater difficulties in Social Competence, $\chi^2(1, N = 152) = 5.369, p = .02$.

Hypothesis 3 and Research Questions: Investigation of child medical and demographic variables on Social Problems and Social Competence.

Type of Diagnosis

First, contrary to the hypothesis, children's type of cancer diagnosis was not associated with Social Problems or Social Competence across informants. A series of ANOVAs comparing children with leukemia, lymphoma, brain tumors, and other solid tumors yielded no significant differences across informant reports of Social Problems (all $p > .40$) and Social Competence (all $p > .38$).

Gender

Second, there was a significant effect for gender, with girls self-reporting greater Social Problems ($M = 3.37, SD = 3.32$) than boys ($M = 2.20, SD = 2.38$). This effect was significant

when calculated using raw scores, $t(155) = 2.54, p = .01$, but not when using age and gender adjusted T scores ($p = .07$). In addition, the tendency for mothers to report greater Social Problems in daughters ($M = 2.15, SD = 2.67$) versus sons ($M = 1.62, SD = 2.18$) approached significance when using raw scores $t(306) = 1.91, p = .06$, but not T scores ($p = .21$). All other tests of gender effects across informant reports of Social Problems and Social Competence yielded no significant differences, both when using raw scores (all $p > .13$) and T scores (all $p > .21$) in the analyses.

Age at Diagnosis

Third, correlation analyses between age at diagnosis and social functioning were conducted. To allow for greater variability, age at diagnosis was calculated in months. Older age at diagnosis was related to greater Social Competence across mother $r(301) = .32, p < .001$, father $r(160) = .26, p = .001$, and child $r(152) = .28, p < .001$ reports when using raw CBCL and YSR raw scores. All correlations between age at diagnosis and Social Competence were significant when repeated using T scores (all $p < .01$). Specifically, younger age at diagnosis was associated with greater Social Problems according to mother reported raw CBCL scores $r(308) = -.16, p = .005$, but not T scores ($p = .31$). Neither father nor child report of Social Problems were significantly correlated to child's age at diagnosis according to raw scores (all $p > .20$) and T scores (all $p > .20$).

Time since Diagnosis

Fourth, correlation analyses were conducted between informant reports of social functioning and time since diagnosis. Father reports of age and gender adjusted T scores of child Social Problems were correlated with time since diagnosis $r(162) = .18, p = .02$, indicating greater problems in children further from diagnosis. This correlation was not significant when calculated using the raw scores for father report of child Social Problems ($r = .14; p = .08$).

Analyses approached significance indicating decreased Social Competence with time according to mother report when using raw scores $r(301) = -.11, p = .06$, as well as age and gender adjusted T scores $r(301) = -.11, p = .053$. All other analyses of time since diagnosis yielded non-significant effects, both when using raw scores (all $p > .51$) and T scores (all $p > .35$).

Hypothesis 4 and Research Questions: Investigation of parent demographic variables on Social Problems and Social Competence.

Family Income

As hypothesized, greater family income was associated with greater child Social Competence as well as lower Social Problems in children diagnosed with cancer. Family income was positively correlated with Social Competence according to mother $r(296) = .35, p < .001$, father $r(158) = .22, p = .005$, and child $r(147) = .42, p < .001$, reports of raw CBCL/YSR scores. All correlations remained significant when calculated using Social Competence T scores ($r = .35$ to $.41$, all $p < .004$).

Lower family income was associated with greater social problems. Family income was negatively correlated with Social Problems according to mother reported raw Social Problems scores $r(302) = -.25, p < .001$, as well as age and gender adjusted T scores $r(300) = -.24, p < .001$. Family income was also significantly negatively correlated with child reported Social Problem T scores $r(151) = -.17, p = .04$, but not raw scores ($r = -.14, p = .09$). There was a trend for lower family income being related to greater Social Problems as reported by fathers when using raw scores $r(161) = -.15, p = .052$, but not T scores, $r = -.14, p = .08$.

Parental Education

A relationship was found between parental education and children's Social Competence and Social Problems. Mothers' years of education was positively correlated with mother report of

child Social Competence $r(298) = .15, p = .001$, as well as child self reported Social Competence $r(142) = .19, p = .02$ when using raw scores, as well as T scores ($r = .16$ to $.19$, both $p > .02$). All other correlations between maternal education and child Social Competence/Problems were non-significant (all $p > .07$). Years of education obtained by the father were positively correlated with child Social Competence according to both mother $r(148) = .23, p = .004$, and father $r(162) = .35, p < .001$ report. The correlations between years of education obtained by the father and maternal and paternal reports of child Social Competence were both significant when repeated using age and gender adjusted T scores ($r = .25$ -. $.35, p < .004$); however, the relationship between years of education and Social Competence as reported by father was not. There was also a trend for education obtained by the father to be positively associated with child self reported raw social competence scores ($r = .22, p = .052$), and this relationship was significant when using age and gender adjusted T scores $r(77) = .23, p = .04$. Years of education obtained by father was also negatively correlated with father report of child Social Problems using raw scores $r(163) = -.17, p = .03$, but not T scores $p = .11$. All other correlations between years of education obtained by the father and child Social Competence/Problems were non significant (all $p > .10$).

Parent Marital Status

Analyses were conducted comparing social functioning of youth with a single parent vs. partnered parents. Parents were denoted as single if they reported their marital status as “Single”, “Divorced”, “Separated”, or “Widowed.” Parents were denoted as partnered if they indicated they were “Married”, “Remarried”, or “Living with Someone.” A series of t -tests (see Table 3 for M s and SD s) revealed that single parenting was associated with lower Social Competence in children recently diagnosed with cancer, both according to mother, $t(221) = 2.85, p = .001$, and child report, $t(95) = 4.18, p < .001$ of child Social Competence using raw scores, as well as T scores

(both $p < .002$). Maternal single status, as opposed to partnered, was also associated with greater child self report of Social Problems, $t(100) = -2.61, p = .01$, and this effect held when analyzed using age and gender adjusted T scores ($p = .007$). The effect of maternal marital status on mother report of child Social Problems was non significant ($p > .26$).

There was an effect of paternal single versus partner status on child self report of Social Competence, with children of single fathers reporting lower Social Competence than those with married/partnered fathers, $t(48) = 2.84, p = .007$, and this effect was also significant when calculated with T scores ($p = .005$). No other significant effects were found for paternal partnered status on father or child reports of social functioning (all $p > .07$).

CHAPTER IV

DISCUSSION

The current study investigated social functioning in children recently diagnosed with cancer in a large, multiple-informant study of a sample of children with a range of different cancer diagnoses. Previous studies investigating this topic have been largely impeded by heterogeneity in methodological approaches, often including small sample sizes, single informants, and extensive variation in time since diagnosis. To address these limitations, the current study included a large sample of children recruited within the first few months of their cancer diagnosis from 2007-2012 in order to assess social functioning problems associated with children currently receiving treatment. Social functioning was assessed via the Social Competence and Social Problems subscales of the CBCL and YSR (Achenbach & Rescorla, 2001). Although both these scales assess facets of interactions with others, these constructs are distinct, and they yielded different patterns of findings. Further, preliminary analyses of the correlations between these subscales yielded significant small to medium negative correlations within both mother and father report of these subscales. The correlation between child self reported Social Problems and Social Competence was non significant. These differences in correlation significance are consistent with previously noted differential reporting patterns on the CBCL and YSR according to informant (Achenbach & Rescorla, 2001).

A primary goal of this study was to determine whether children diagnosed with cancer experience greater difficulties in Social Problems and Social Competence relative to population norms. A secondary goal was to identify demographic and medical variables that may be associated with greater difficulties in social functioning in children recently diagnosed with cancer.

Support was found for the first hypothesis, which purported that Social Problems would be significantly elevated and Social Competence would be significantly decreased in children diagnosed with cancer relative to population norms. Indeed, this hypothesis was confirmed across reports from mothers, fathers and children for both the Social Competence and Social Problems scales. These findings confirm previous reports of elevated Social Problems and decreased Social Competence in children with cancer relative to controls (e.g. Brinkman et al., 2012; Fossen et al., 1998; Mulhern et al., 1989; Pendley et al., 1997). Other studies, however, have reported no significant differences in social functioning between children diagnosed with cancer and healthy peers (Gerhardt et al., 2007; Noll et al., 1999). It is noteworthy that in both the latter studies, a *T* score difference of .50 standard deviations or more was noted on the Social Competence scale of the CBCL. However, the authors reported no significant differences relative to the control sample used within each study (Gerhardt et al., 2007; Noll et al., 1999). This small to medium effect size relative to population norms is significant, and highlights a reliable difference indicating a greater impairment in social functioning in children diagnosed with cancer relative to population norms. Notably, the current findings indicated that this effect was present across mother, father, and child self report on both the Social Competence and Social Problems subscales.

It was further hypothesized that a greater number of children in this sample would be in the borderline and clinical ranges on the Social Problems and Social Competence scales relative to those expected within the general population. Partial support was found for this hypothesis. Overall, there was stronger evidence that a greater number of children recently diagnosed with cancer experience difficulties in the borderline and clinical range on the Social Competence scale than on the Social Problems scale. These findings highlight the importance of investigating various facets of social functioning within the same sample. Whereas Social Competence pertains

to participation in activities and peer relationships, the Social Problems scale refers to immature and clumsy behaviors as well as peer conflict.

There were no significant differences between the percentage of children recently diagnosed with cancer in the clinical or borderline range of Social Problems and those expected according to population norms. This null finding held across mother, father and child self report of Social Problems. Children recently diagnosed with cancer appear to experience elevated rates of Social Problems, but these difficulties are not disproportionally at the clinical level. A limited number of studies have reported data from the Social Problems subscale of the CBCL, YSR, or TRF. It is possible that Social Problems increase as children progress into survivorship. Consistent with this, within the CCSS, using modified Social Problems subscale, survivors of pediatric cancer experienced greater problems in this domain than their healthy siblings (Schultz et al., 2007). Of note, certain of the items on the Social Problems subscale correspond to dependent behaviors (e.g. “clings to adults or too dependent”) that may be fostered in young children undergoing difficult cancer treatment therapies and maintained in their peer relationships when the child returns to school. These dependent behaviors may not be considered as problematic while the child is undergoing treatment, but may become more salient once the child is no longer in the critical phases of treatment and progresses to survivorship and returns to school.

There was greater support of the second hypothesis using the Social Competence scale. A larger proportion of children diagnosed with cancer obtained scores on the Social Competence scale that were in the clinical and borderline ranges relative to the normative population. Across all informants, a larger percentage of children diagnosed with cancer received scores in the borderline and below range on the Social Competence scale, which is indicative of greater problems in this area, relative to those expected in the general population. With an expected 7%

of children in the normative population falling in the borderline to clinical range, 15.9-17.8% of children diagnosed with cancer were reported to have borderline to clinical difficulties in Social Competence across mother, father, and child self report. This finding is consistent with previous literature indicating children diagnosed with cancer experience significant difficulties in Social Competence (e.g. Brinkman et al., 2012; Fossen et al., 1998; Mulhern, et al., 1989; Olson et al., 1993). Notably, according to father report, children diagnosed with cancer were approximately four times more likely than children within the general population to be in the clinical range on the Social Competence scale. It is possible that the decreased participation in sports and organizations assessed via this scale may be particularly salient to fathers, who may be more involved in this domain of a child's life. These significant differences also complement the literature reporting that children diagnosed with cancer are more socially isolated than their peers (Noll et al., 1990, 1991, 1993; Vannatta et al., 1998), given that the Social Competence scale of the CBCL and YSR assesses participation in activities and peer relationships.

As previously noted, a criticism of the Social Competence scale is that children with chronic illnesses may obtain lower scores on this scale due to medical restrictions and not low desire to participate (Drotar et al., 1995). It is important to note that this scale was not meant to assess lack of desire for social interactions and social activities, but rather objective participation in activities and peer relationships. Regardless of reason for low Social Competence, decreased participation in activities and friendships deprive children from these social experiences and ultimately may contribute to further difficulties. Indeed, impairments in social functioning significantly impact other areas of functioning, including overall social, emotional and cognitive growth (Newcomb & Bagwell, 1996). Difficulties in early peer relationships have been associated with depressive symptoms (Morison & Masten, 1991), social anxiety (Vernberg, Abwender, Ewell, & Beery; 1992), school dropout (French & Conrad; 2001), and even lower

economic success in adulthood (Conti, Galeotti, Meuller, & Pudney, 2009).

This study further investigated potential demographic and medical variables that may be associated with difficulties in social functioning in children recently diagnosed with cancer. One of the primary hypotheses was that type of diagnosis, and particularly a brain tumor diagnosis, would be associated with poorer social functioning. Across all informants and both scales, no support was found for this hypothesis. It is possible that the low number of children with brain tumors in our study (N= 29) did not provide sufficient power to detect effects. Further, not all informants reported on each child diagnosed with a brain tumor, thereby further limiting the sample sizes for these analyses. However, it is possible that differences in social functioning between children diagnosed with brain tumors and those diagnosed with other forms of pediatric cancer emerge over time. Consistent with this, Mulhern et al. (1993) did not find any differences between children recently diagnosed with brain tumors and those recently diagnosed with other forms of cancer across CBCL scales (including the Social Competence scale). Studies that did note significant differences between children diagnosed with brain tumors and other cancers included children several years past diagnosis (Bonner et al., 2008; Carpentieri, et al., 1993; Fossen, et al., 1998; Vannatta, et al., 1998).

Younger age at diagnosis was associated with greater Social Problems and decreased Social Competence. This finding confirms, within a sample of children diagnosed with heterogeneous cancers, the results of the large study by Brinkman et al. (2012) of children diagnosed with embryonal tumors. Older children tend to have a larger, more established social network (La Greca & Bearman, 2003) and therefore may have an easier time maintaining interaction with others throughout diagnosis and early treatment. Finally, this finding highlights the need to pay particular attention to young children when designing social skills training intervention programs for children diagnosed with cancer.

There was some indication that greater time since diagnosis was associated with greater Social Problems and decreased Social Competence. This is consistent with a previous finding by Vago et al. (2011). However, it is possible that there was not enough variability in time since diagnosis to adequately test this question. For the purpose of this study, we attempted to enroll a sample as close to diagnosis as possible in order to provide a stronger test of social functioning at this time point. Regardless, given that the CBCL and YSR measures were returned by families at various times after the child's diagnosis, there was some variability in time since diagnosis and I therefore endeavored to test this possible correlate.

There was some evidence that girls experience a greater number of Social Problems than boys, however, the differences between genders were not significant when taking into account age and gender based norms. This contradicts findings from a large study by Brinkman et al. (2012). However, it is possible that the specificity of diagnostic type (embryonic tumors only) limits the generalizability of the findings by Brinkman et al. to children diagnosed with other forms of pediatric cancer. The current null effect, based on a larger sample of children with heterogeneous cancers, is consistent with a series of studies also reporting no significant gender differences in social functioning in children diagnosed with cancer (Ida et al., 1994; Katz, Leary, Breiger & Friedman, 2010; Mulhern et al., 1989; Noll et al., 1990; Vannatta et al., 1998).

There was support for the hypothesized relationships between child social functioning and parent income, education and marital status. Lower family income, lower education achieved and single marital status were each associated with decreased Social Competence and greater Social Problems. This finding is consistent with previous research noting that these parental demographic variables are associated with difficulties in social functioning in children diagnosed with cancer (Barrera et al., 2005; Brinkman et al., 2012; Koocher & O'Malley, 1981; Mulhern et al., 1993; Schultz et al., 2007).

Strengths of Current Study

There were several methodological strengths to this study. First, of the sample of children recently diagnosed with cancer was relatively large. This sample size allowed for tests of several variables of interest. Second, multiple informants were used to assess the constructs of Social Competence and Social Problems. Of note, informants included a significant number of fathers. A limited number of studies investigating social functioning of children diagnosed with cancer report data obtained from fathers (Gerhardt et al., 2007a, 2007b; Mulhern et al., 1993; Noll et al., 1999). Given that some findings within this study varied according to informant, each informant provided a valuable, unique perspective on child social functioning. The current results highlight the need to include father report in the study of the social functioning of children diagnosed with cancer. Third, well-validated measures with large census-based normative samples were used. This allowed for calculation of meaningful differences between children diagnosed with cancer and age and gender matched children from the general population. Fourth, two different facets of social functioning, Social Problems and Social Competence, were assessed. Finally, the sample consisted of children diagnosed between (2007-2011) with heterogeneous cancers. Given the changes in medical treatment for pediatric cancer patients, assessing these constructs in children recently diagnosed is crucial in order to obtain information that will guide the development of interventions that meet the needs of the current population of children diagnosed with cancer.

Limitations of the Current Study

Although this study contained notable strengths, several limitations may also be described. First, the sample contained a limited number of children with brain tumors. This may have underpowered analyses conducted when comparing different diagnostic groups. However, the number of children with brain tumors in this sample (N=29) is comparable to other studies of children diagnosed with brain tumors (N=40, Carpentieri et al., 1993; N= 16, Fossen et al., 1998;

N=38, Radcliffe et al., 1996; N=25, Vago et al., 2011). Second, a larger number of mothers than fathers completed surveys, and therefore reports from both parents were not available for all children. Nevertheless, a substantial number of fathers provided data and allowed for the test of potential effects of father demographic variables. Finally, although parents reported on children ages 5-17, children only self reported if at least 10 years old. This limitation in child report data is due to the constraints of the measurement instrument. Regardless, the CBCL and YSR remain useful tools in the assessment of Social Competence and Social Problems given their validity and the normative data associated with these measures.

Implications for Future Research

The findings from this study are relevant to the development of future social skills training programs for children diagnosed with cancer. Currently, findings from three social skills training interventions for children diagnosed with cancer have been reported (Barakat et al., 2002; Barrera & Schulte., 2009; Varni et al. 1993), highlighting the importance of addressing difficulties in social functioning in pediatric cancer patients. These findings may aid in the development of future interventions. First, findings from the Social Competence and Social Problems scales allow for a greater understanding of targets for interventions. Relative to the RCP, which includes some specific items but also includes several broader items (e.g., “is a good leader”) wherein the actions underlying these designations are unclear (Dirks & Weersing, 2007), the items on the ASEBA scales are more specific and allow for concrete targets for intervention. Greater support was found for children experiencing borderline and clinical difficulties in Social Competence relative to Social Problems, further delineating critical areas for intervention. Second, findings from this study regarding the significant correlates of difficulties in social functioning in children diagnosed with cancer bear significance for the target population of future interventions. Given that resources are often limited, there is a need to identify those who are

most in need of further services. Findings from this study indicate that younger children of single, low-income parents are in particular need of additional help in this domain of functioning.

To conclude, of the current study provides some new information on the social functioning in children diagnosed with cancer. The findings reflect how children receiving recent treatment for cancer are functioning according to Social Competence and Social Problems. These findings may inform the development of future social skills interventions in order to provide interventions that meet the current needs of children diagnosed with cancer.

REFERENCES

- Achenbach, T.M., & Rescorla, L.A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families.
- Adamoli, L., Deasy-Spinetta, P., Corbetta, a, Jankovic, M., Lia, R., Locati, a, Fraschini, D., et al. (1997). School functioning for the child with leukemia in continuous first remission: screening high-risk children. *Pediatric hematology and oncology*, 14(2), 121–31. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/9089740>
- Barakat, L. P., Hetzke, J. D., Foley, B., Carey, M. E., Gyato, K., & Phillips, P. C. (2002). Evaluation of a social-skills training group intervention with children treated for brain tumors: a pilot study. *Journal of pediatric psychology*, 28(5), 299–307. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/12808006>
- Barrera, M., Shaw, A. K., Speechley, K. N., Maunsell, E., & Pogany, L. (2005). Educational and social late effects of childhood cancer and related clinical, personal, and familial characteristics. *Cancer*, 104(8), 1751–60. doi:10.1002/cncr.21390
- Barrera, M., & Schulte, F. (2009). A group social skills intervention program for survivors of childhood brain tumors. *Journal of pediatric psychology*, 34(10), 1108–18. doi:10.1093/jpepsy/jsp018
- Barrera, M., Spiegler, B. J., & Baruchel, S. (2000). Social difficulties in children treated for brain tumors. Unpublished manuscript.
- Bessell, A. G. (2001). Children Surviving Cancer : *Exceptional Children*, 67(3), 345–359.
- Boman, K., & Bodegård, G. (1997). Psychological long-term coping with experience of disease and treatment in childhood cancer survivors. *Acta paediatrica (Oslo, Norway : 1992)*, 86(9), 1026–7. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/9343296>
- Boman, K. K., & Bodegård, G. (2004). Life after cancer in childhood: social adjustment and educational and vocational status of young-adult survivors. *Journal of pediatric hematology/oncology*, 26(6), 354–62. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/15167348>
- Bonner, M. J., Hardy, K. K., Willard, V. W., Anthony, K. K., Hood, M., & Gururangan, S. (2008). Social functioning and facial expression recognition in survivors of pediatric brain tumors. *Journal of pediatric psychology*, 33(10), 1142–52. doi:10.1093/jpepsy/jsn035
- Brinkman, T. M., Palmer, S. L., Chen, S., Zhang, H., Evankovich, K., Swain, M. a, Bonner, M. J., et al. (2012). Parent-reported social outcomes after treatment for pediatric embryonal tumors: a prospective longitudinal study. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*, 30(33), 4134–40. doi:10.1200/JCO.2011.40.6702
- Brown, R. T., Kaslow, N. J., Hazzard, a P., Madan-Swain, a, Sexson, S. B., Lambert, R., & Baldwin, K. (1992, May). Psychiatric and family functioning in children with leukemia and their parents. *Journal of the American Academy of Child and Adolescent Psychiatry*. doi:10.1097/00004583-199205000-00017
- Byrne, J., Fears, T. R., Steinhorn, S. C., Mulvihill, J. J., Connelly, R. R., Austin, D. F., ... & Myers, M. H. (1989). Marriage and divorce after childhood and adolescent cancer. *JAMA: the journal of the American Medical Association*, 262(19), 2693-2699.
- Carlson-green, Morris, & Krawiecki. (1995). Family and Illness Predictors of Outcome in, 20(6), 769–784.

- Carpentieri, S. C., Mulhern, R. K., Douglas, S., Hanna, S., & Fairclough, D. L. (1993). Behavioral resiliency among children surviving brain tumors: A longitudinal study. *Journal of Clinical Child Psychology*, 22(2), 236-246.
- Challinor, J., Miaskowski, C., Moore, I., Slaughter, R., & Franck, L. (2000). Review of research studies that evaluated the impact of treatment for childhood cancers on neurocognition and behavioral and social competence: Nursing implications. *Journal for Specialists in Pediatric Nursing*, 5(2), 57-73.
- Chesler, M., & Barbarin, O. (1986). Parents' perspectives on the school experiences of children with cancer. *Topics in Early Childhood and Special Education*, 5, 36-48.
- Conti G, Galeotti A, Meuller G, Pudney S. Popularity. Institute for Social and Economic Research; 2009. Publication No. 2009-03. Available at: www.iser.essex.ac.uk. Accessed April 20, 2010
- Dirks, M. A., Treat, T. A., & Robin Weersing, V. (2007). Integrating theoretical, measurement, and intervention models of youth social competence. *Clinical Psychology Review*, 27(3), 327-347.
- Drotar, D., Stein, R. E., & Perrin, E. C. (1995). Methodological issues in using the child behavior checklist and its related instruments in clinical psychology research. *Journal of Consulting and Clinical Child Psychology*, 24, 184-192.
- Eiser, C., Hill, J. J., & Vance, Y. H. (2000). Examining the psychological consequences of surviving childhood cancer: systematic review as a research method in pediatric psychology. *Journal of pediatric psychology*, 25(6), 449-60. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10980049>
- Fossen, A., Abrahamsen, T. C., & Storm-Mathisen, I. (1998). Psychological outcome in children treated for brain tumor. *Pediatric Hematology-Oncology*, 15(6), 479-488.
- French DC, Conrad J. School dropout as predicted by peer rejection and antisocial behavior. *J Res Adolesc*. 2001;11(3): 225-244
- Fuemmeler, B. F., Elkin, T. D., & Mullins, L. L. (2002a). Survivors of childhood brain tumors: behavioral, emotional, and social adjustment. *Clinical psychology review*, 22(4), 547-85. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/12094511>
- Ganesalingam, K., Sanson, A., Anderson, V., & Yeates, K. O. (2006). Self-regulation and social and behavioral functioning following childhood traumatic brain injury. *Journal of the International Neuropsychological Society : JINS*, 12(5), 609-21. doi:10.1017/S1355617706060796
- Gerhardt, C. a, Vannatta, K., Valerius, K. S., Correll, J., & Noll, R. B. (2007a). Social and romantic outcomes in emerging adulthood among survivors of childhood cancer. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*, 40(5), 462.e9-15. doi:10.1016/j.jadohealth.2006.12.004
- Gerhardt, C. A., Dixon, M., Miller, K., Vannatta, K., Valerius, K. S., Correll, J., & Noll, R. B. (2007b). Educational and occupational outcomes among survivors of childhood cancer during the transition to emerging adulthood. *Journal of Developmental & Behavioral Pediatrics*, 28(6), 448-455.
- Gray, C. C., & Rodrigue, J. R. (2001). Brief report: perceptions of young adolescents about a hypothetical new peer with cancer: an analog study. *Journal of pediatric psychology*, 26(4), 247-52. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11329484>
- Hardy, K. K., Willard, V. W., Watral, M. A., & Bonner, M. J. (2010). Perceived social competency in children with brain tumors: comparison between children on and off therapy.

- Journal of pediatric oncology nursing : official journal of the Association of Pediatric Oncology Nurses*, 27(3), 156–63. doi:10.1177/1043454209357918
- Howlader N, Noone AM, Krapcho M, Garshell J, Neyman N, Altekruse SF, Kosary CL, Yu M, Ruhl J, Tatalovich Z, Cho H, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2010, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2010/, based on November 2012 SEER data submission, posted to the SEER web site, April 2013.
- Hudson, M. M., Mertens, A. C., Yasui, Y., Hobbie, W., Chen, H., Gurney, J. G., et al. (2003). Health status of adult long-term survivors of childhood cancer; A report from the childhood cancer survivor study. *Journal of the American Medical Association*, 290, 1583–1592.
- Katz, L. F., Leary, A., Breiger, D., & Friedman, D. (2011). Pediatric cancer and the quality of children's dyadic peer interactions. *Journal of pediatric psychology*, 36(2), 237–47. doi:10.1093/jpepsy/jsq050
- Koocher, G. P., O'Malley, J. E., Gogan, J. L., & Foster, D. J. (1980). Psychological adjustment among pediatric cancer survivors. *Journal of Child Psychology and Psychiatry*, 21, 165–173. Downloaded from <http://jpepsy.oxfordjournals.org/> at Vanderbilt University - Massey Law Library on January 3, 2013
- Kurtz, B. P., & Abrams, A. N. (2010). Psychiatric aspects of pediatric cancer. *Child and adolescent psychiatric clinics of North America*, 19(2), 401–21, x–xi. doi:10.1016/j.chc.2010.01.009
- La Greca, A., & Bearman, K. (2003). Peer Relations. In Brown, R. T. (Ed.). *Handbook of pediatric psychology in school settings*. Routledge.
- La Greca, A. M., Bearman, K. J., & Moore, H. (2002). Peer relations of youth with pediatric conditions and health risks: promoting social support and healthy lifestyles. *Journal of developmental and behavioral pediatrics : JDBP*, 23(4), 271–80. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/12177575>
- Martinez, W., Carter, J. S., & Legato, L. J. (2011). Social Competence in Children with Chronic Illness: A Meta-analytic Review. *Journal of Pediatric Psychology*, 36(8), 878–890.
- Masten, A. S., Morison, P., & Pellegrini, D. S. (1985). A revised class play method of peer assessment. *Developmental Psychology*, 21(3), 523.
- Martinson, I. M., & Bossert, E. (1994). The psychological status of children with cancer. *Journal of child and adolescent psychiatric nursing : official publication of the Association of Child and Adolescent Psychiatric Nurses, Inc*, 7(2), 16–23. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/8000777>
- Morison P, Masten AS. Peer relationships in middle childhood as a predictor of adaptation in adolescence: a seven-year follow-up. *Child Dev*. 1991;62(5):991–1007
- Mulhern, R K, Carpentieri, S., Shema, S., Stone, P., & Fairclough, D. (1993). Factors associated with social and behavioral problems among children recently diagnosed with brain tumor. *Journal of pediatric psychology*, 18(3), 339–50. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/8340843>
- Mulhern, R. K., Wasserman, A. L., Friedman, A. G., & Fairclough, D. (1989). Social competence and behavioral adjustment of children who are long-term survivors of cancer. *Pediatrics*, 83(1), 18–25.
- Ness, K.K., Hudson, M.M., Ginsberg, J.P., Nagarajan, R., Kaste, S.C., Marina, N., Whitton, J., Robison, L.L., & Gurney, J.G.(2009) Physical Performance Limitations in the Childhood

Cancer Survivor Study Cohort. *Journal of Clinical Oncology*. vol. 27 no. 14, p. 2382-2389.

- Newcomb, A. F. & Bagwell, C. (1996) 'The developmental significance of children's friendship relations', in W. M. Bukowski, A. F. Newcomb & W. W. Hartup (eds), *The company they keep: Friendship in childhood and adolescence*, pp. 289–321. Cambridge, USA: Cambridge University Press.
- Noll, R B, Bukowski, W. M., Rogosch, F. a, LeRoy, S., & Kulkarni, R. (1990). Social interactions between children with cancer and their peers: teacher ratings. *Journal of pediatric psychology*, 15(1), 43–56. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/2324909>
- Noll, R. B., Bukowski, W. M., Davies, W. H., & Koontz, K. (1993). Adjustment in the Peer System of Adolescents with Cancer: A Two Year Study, *Journal of Pediatric Psychology*, 18(3), 351–364.
- Noll, R. B, Gartstein, M. A., Vannatta, K., Correll, J., William, M., Davies, W. H., & Bukowski, W. M. (1999) Social, emotional, and behavioral functioning of children with cancer. *Pediatrics*. 103(1):71–8.
- Noll, R B, LeRoy, S., Bukowski, W. M., Rogosch, F. a, & Kulkarni, R. (1991). Peer relationships and adjustment in children with cancer. *Journal of pediatric psychology*, 16(3), 307–26. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/1890557>
- Noll, R B, MacLean, W. E., Whitt, J. K., Kaleita, T. a, Stehbens, J. a, Waskerwitz, M. J., Ruymann, F. B., et al. (1997). Behavioral adjustment and social functioning of long-term survivors of childhood leukemia: parent and teacher reports. *Journal of pediatric psychology*, 22(6), 827–41. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/9494320>
- Noll, Robert B, & Bukowski, W. B. (2012). Commentary: social competence in children with chronic illness: the devil is in the details. *Journal of pediatric psychology*, 37(9), 959–66; discussion 867–71. doi:10.1093/jpepsy/jss058
- Olson, a. L., Boyle, W. E., Evans, M. W., & Zug, L. a. (1993). Overall Function in Rural Childhood Cancer Survivors: The Role of Social Competence and Emotional Health. *Clinical Pediatrics*, 32(6), 334–342. doi:10.1177/000992289303200603
- Patenaude, A. F., & Kupst, M. J. (2005). Psychosocial functioning in pediatric cancer. *Journal of pediatric psychology*, 30(1), 9-27.
- Pendley, J. S., Dahlquist, L. M., & Dreyer, Z. (1997). Body image and psychosocial adjustment in adolescent cancer survivors. *Journal of pediatric psychology*, 22(1), 29–43. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/9019046>
- Perrin, E. C., Stein, R. E., & Drotar, D. (1991). Cautions in using the Child Behavior Checklist: observations based on research about children with a chronic illness. *Journal of pediatric psychology*, 16(4), 411–21. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/1941423>
- Rodriguez, E. M., Dunn, M. J., Zuckerman, T., Vannatta, K., Gerhardt, C. A., & Compas, B. E. (2011). Cancer-Related Sources of Stress for Children With Cancer and Their Parents. *Journal of Pediatric Psychology*, 37(2), 1-13.
- Sawyer, M. G., Antoniou, G., Nguyen, a M., Toogood, I., Rice, M., & Baghurst, P. (1995). A prospective study of the psychological adjustment of children with cancer. *Journal of pediatric hematology/oncology*. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/18287186>
- Schultz, K. A. P., Ness, K. K., Whitton, J., Recklitis, C., Zebrack, B., Robison, L. L., Zeltzer, L., et al. (2007a). Behavioral and social outcomes in adolescent survivors of childhood cancer: a

- report from the childhood cancer survivor study. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*, 25(24), 3649–56.
doi:10.1200/JCO.2006.09.2486
- Stam, H., Grootenhuys, M. A., & Last, B. F. (2001). Social and emotional adjustment in young survivors of childhood cancer. *Supportive care in cancer official journal of the Multinational Association of Supportive Care in Cancer*, 9(7), 489–513.
- Syndikus, I., Tait, D., Ashley, S., & Jannoun, L. (1994). Long-term follow-up of young children with brain tumors after irradiation. *International Journal of Radiation Oncology* Biology* Physics*, 30(4), 781–787.
- Turner, C. D., Rey-Casserly, C., Liptak, C. C., & Chordas, C. (2009). Late effects of therapy for pediatric brain tumor survivors. *Journal of child neurology*, 24(11), 1455–63.
doi:10.1177/0883073809341709
- Upton, P., & Eiser, C. (2006). School experiences after treatment for a brain tumour. *Child: care, health and development*, 32(1), 9–17. doi:10.1111/j.1365-2214.2006.00569.x
- U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999–2009 Incidence and Mortality Web-based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2013. Available at: www.cdc.gov/uscs.
- Vago, C., Bulgheroni, S., Usilla, A., Biassoni, V., Serra, A., Gentile, S., Ajovalasit, D., et al. (2011). Adaptive functioning in children in the first six months after surgery for brain tumours. *Disability and rehabilitation*, 33(11), 953–60. doi:10.3109/09638288.2010.520804
- Vance, Y. H., & Eiser, C. (2002). The school experience of the child with cancer. *Child: care, health and development*, 28(1), 5–19. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11856182>
- Vannatta, K., Gartstein, M. a, Short, a, & Noll, R. B. (1998). A controlled study of peer relationships of children surviving brain tumors: teacher, peer, and self ratings. *Journal of pediatric psychology*, 23(5), 279–87. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/9782676>
- Vannatta, Kathryn, Gerhardt, C. A., Wells, R. J., & Noll, R. B. (2007). Intensity of CNS Treatment for Pediatric Cancer : Prediction of Social Outcomes in Survivors. *Pediatric Blood and Cancer*, (April 2006), 716–722. doi:10.1002/pbc
- Varni, J. W., & Katz, E. R. (1997). Stress, social support and negative affectivity in children with newly diagnosed cancer: a prospective transactional analysis. *Psycho-Oncology*, 6(4), 267–278.
- Varni, J.W., Katz, E. R., Colegrove, R., Jr., & Dolgin, M. (1993). The impact of social skills training on the adjustment of children with newly diagnosed cancer. *Journal of Pediatric Psychology*, 18, 751–767.
- Varni, J. W., Katz, E. R., Colegrove Jr, R., & Dolgin, M. (1994). Perceived social support and adjustment of children with newly diagnosed cancer. *Journal of Developmental & Behavioral Pediatrics*, 15(1), 20–26.
- Varni, J. W., Katz, E. R., & Dolgin, M. (1996). Family functioning predictors of adjustment in children with newly diagnosed cancer: A prospective analysis. *Journal of Child Psychology and Psychiatry*, 37(3), 321–328.
- Vernberg, E. M., Abwender, D. A., Ewell, K. K., & Beery, S. H. (1992). Social anxiety and peer relationships in early adolescence: A prospective analysis. *Journal of Clinical Child Psychology*, 21(2), 189–196.

Yeates, K. O., Bigler, E. D., Dennis, M., Gerhardt, C. A., Rubin, K. H., Stancin, T., ... & Vannatta, K. (2007). Social outcomes in childhood brain disorder: a heuristic integration of social neuroscience and developmental psychology. *Psychological bulletin*, 133(3), 535.

TABLES

Table 1. *Demographic characteristics of mothers, fathers, and children.*

	Mothers (n = 313)		Fathers (n = 165)		Children (n = 327)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	37.88	7.52	39.88	7.88	10.58	3.95
Years of Education	16.07	3.91	15.95	4.27	5.34	3.89
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Race						
White	266	85.0	147	89.1	276	84.4
African-American	30	9.6	12	7.3	32	9.8
Asian-American	3	1.0	1	0.6	1	0.3
American-Indian/Native Alaskan	1	0.3	0	0	1	0.3
Other	12	3.8	5	3	17	5.2
Not reported	1	0.3	0	0	0	0
Annual Family Income						
≤ \$25,000	91	28.6	35	20.8	-	-
\$25,001 – \$50,000	90	28.3	42	25	-	-
\$50,001 – \$75,000	50	15.7	35	20.8	-	-
\$75,001 – \$100,000	38	11.9	25	14.9	-	-
≥ \$100,000	49	15.4	31	18.5	-	-
Marital Status						
Married/Living with Someone	234	74.8	153	92.7	-	-
Single, Divorced, Separated, Or Widowed	77	24.6	11	6.7	-	-
Not Reported	2	0.6	1	0.6	-	-

Table 2. Correlations Between Social Problems and Social Competence T Scores Within and Across Informants.

		Social Competence		
		Mothers' Reports	Fathers' Reports	Child/Adolescent Self-Report
Social Problems	Mother Report	-.28**	-.25**	-.17*
	Father Report	-.26**	-.29**	-.09
	Child Report	-.08	-.18	-.12

Note. ** Correlation is significant at the .01 level.

* Correlation is significant at the .05 level.

Table 3. Means and Standard Deviations of Mother, Father and Child Report of Child Social Competence & Social Problems.

	Mothers' Reports (n =)		Fathers' Reports (n =)		Child/Adolescent Self-Report (n =)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Social Problems Total	53.67	5.53	53.01	4.28	54.12	6.38
Social Problems: Females	54.10	6.09	53.42	4.35	55.00	7.42
Social Problems : Males	53.30	4.94	52.65	4.22	53.14	4.84
Social Competence Total	46.00	9.58	45.45	9.82	47.40	10.20
Social Competence: Females	46.37	9.46	44.93	9.87	47.82	10.62
Social Competence: Males	45.65	9.72	45.91	9.81	46.84	9.78

Note. Means and standard deviations are presented for the full sample. Social Problems and Social Competence scores are presented as normalized *T* scores from the CBCL for mothers' and fathers' reports and from the YSR for child/adolescents' self-reports.

Table 4. *Percentages of children diagnosed with cancer and those expected within the general population in the borderline and clinical ranges.*

	Borderline		Clinical	
	<i>Children diagnosed with cancer</i>	<i>Children in normative sample</i>	<i>Children diagnosed with cancer</i>	<i>Children in normative sample</i>
Social Problems T score				
Mother report	5.3%	7%	2.3%	2%
Father report	3.7%	7%	0%	2%
Child report	7.1%	7%	4.5%	2%
Social Competence T score				
Mother report	17.4%	7%	5.4%	2%
Father report	15.9%	7%	8.8%	2%
Child report	17.8%	7%	6%	2%

Note. The borderline range in this table is used to designate scores that were within the borderline and clinical ranges on each scale.